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TO WHAT EXTENT IS IT PROFITABLE TO RECOGNIZE GEOGRAPHICAL FORMS AMONG NORTH AMERICAN BIRDS?*

BY J. A. ALLEN.

IN THE early days of natural history minute differences of structure, size or color received little attention, and the groups looked upon in early times as species now take, in not a few instances, the rank of a genus, the one wide-ranging species of the early authors having been found to include several species, each with its own circumscribed habitat. Buffon, for example, considered the exotic forms of life which closely resembled European types either as being degenerate forms of the latter, or as slight modifications of them, due to climatic influences, differences of food, etc. Even the species of Linnæus, and of his contemporaries and immediate followers, were often groups of a highly composite character. It was not till much later that the importance of nicer discriminations became apparent.

By the middle of the present century the smallest appreciable deviations became of specific import, and even a difference of habitat was not unfrequently thought to be sufficient ground for the presumption of specific diversity. Consequently individual variations were unwittingly made the basis of specific distinctions.

* Read at the Seventh Congress of the American Ornithologists' Union, Nov. 15, 1889.

In the progress of descriptive zoölogy the quest for new species and new genera became rampant. The distinction of imposing a new name, to be followed by *nobis* or *mihi*, led always to a search for differences. It was natural, in such a scramble, that resemblances should be overlooked, and that the study of individual variation should receive little attention. The synonyms that form such an array in our modern systematic treatises on zoölogy attest the result.

But not all descriptive naturalists erred equally or in the same way. There always have been, of course, both splitters and lumpers, the one class more or less at arms with the other, the one holding the other more or less in contempt. But aside from this individual diversity among naturalists there have been periodic phases of change in the matter of excessive splitting and the reverse, which may be likened to the oscillations of a pendulum. This is especially true in respect to our own country, and notably in regard to North American ornithology during the last half century. Within this period there have been at least three well-defined oscillations of the ornithological pendulum. The first, in the direction of excessive subdivision, reached its culmination about the year 1870. A reverse oscillation immediately followed, sweeping in character, and of strong and sudden impetus. It gradually spent itself during the latter part of the following decade. A third oscillation, in the direction of the first, feebly set in soon after, and, slowly acquiring momentum, now seems to have reached a degree of force that challenges candid consideration.

In this connection a brief review of the progress of our science during the last fifty years may not be out of place.

Fifty years ago there were no large collections of birds, either in public museums or in private cabinets, anywhere in America. About this time the Government instituted a series of transcontinental surveys, extending in nearly parallel lines across the continent from about the 90th meridian westward to the Pacific coast, these lines being run at rather wide intervals from the Mexican border on the south to the British boundary on the north. These several military surveying parties were usually accompanied by good field naturalists and collectors. Also at about the same time the Smithsonian Institution, through the influence and direction of the late Professor Baird, secured correspondents and collectors at many points in British America. All of the collections thus

made were deposited in the National Museum, then commonly known as 'The Smithsonian.' In a few years a large amount of new material was thus brought together from the far West and the remote North. These were the first collections of any magnitude ever received from trans-Mississippian North America. Material from east of the Mississippi River was still scanty, and hence the proper means for careful comparison of eastern and western forms was often lacking.

During the elaboration of this material, derived from hundreds of isolated localities, the discovery of new forms, both generic and specific, was the paramount incentive in the investigation. Not till some years later did the subject of climatic influences upon animals, in other words the evolution of species by environment, receive much consideration. Nor could it have been otherwise. We have first to gather our facts before we can generalize. By these seeming strictures no discredit is intended to the naturalists of that period, nor any condemnation of their methods. They were the pioneers, conducting a careful reconnaissance, and preparing the way for the occupation of the field by the grand army of workers who followed later.

Variations, even when slight, are facts of great import, whether they be individual, climatic, or specific, in the usually accepted sense of this last term; and when, except in the case of purely individual variation, they are made the basis of a name their availability in the discussion of profounder questions is thereby greatly enhanced. Down to as late as 1865, a collection of individuals indicated by a binomial name was a species, theoretically, at least, distinct and definable from any other similar group. An occasional intermediate, when found, was a great stumbling block, usually to be accounted for on the theory of hybridization. Varieties, in the geographical sense of today, were rare indeed, and the term subspecies was almost unknown in zoölogy.

Between the years 1865 and 1870 the question of what was a species had already become a very troublesome one. Many of the then currently recognized species were found to be as elusive as the proverbial flea. The increase of material and better opportunities for investigation showed that the range of individual variation had been underrated, and that many of the alleged differences on which species had been founded were of little or no value, while in many other cases closely allied so-called species

were merely local, intergrading, geographical forms, correlated with special features or conditions of environment.

During the three years including and following the year 1871 ornithological opinion on the subject of species and subspecies, or respecting the status of a large proportion of the birds of North America, experienced a radical disruption. The first great wave, which for generations had been increasing in volume and force, met a barrier against which it recoiled and subsided with phenomenal suddenness, giving place to a strong and sweeping counter current. The key-note to the situation had been struck, and after a brief period of wavering a happy medium course was hit upon, which seemed to solve most of the difficulties that had beset the general subject of species. This was no less than the reduction of numerous so-called species to the rank of geographical races or subspecies, namely such as were found to intergrade with other forms, or which it seemed probable, on general principles, might so intergrade. Immediately inveterate splitters became bold lumpers, and the ornithological pendulum swung quickly back with a momentum sufficient to carry it somewhat beyond the vertical. The term 'var' interposed between the name of the original species (in the sense of the earliest described species) and its various local offshoots was the magic link which was to connect and duly correlate the discordant bird elements of our North American fauna. This, of course, was the origin and first phase of our present trinomial system of nomenclature, which ten years later was formally endorsed and adopted by the American Ornithologists' Union.

While this great step — little less than a revolution in its results — was in the main in the right direction, it led to some rash conclusions, theoretical reasoning now and then overstepping the hard line of facts. Consequently in a few instances species were unduly merged, and it has been necessary to reconsider these hasty rulings. The oscillation in the direction of unwarrantable lumping, however, soon reached its extreme limit; the pendulum settled back, and for a time remained at what we may consider as very near its normal point of equilibrium. For nearly a decade, dating from 1875, the deflections were slight and variable, now to one side, and now slightly to the other. This period of comparative stability includes the work of the A. O. U. Committee, in the years 1883-84, on the status of the described forms of North

American birds. As some hard-and-fast line in respect to subspecies was necessary it was very properly agreed by the Committee that no species should be reduced to a subspecies except on proof of intergradation. This kind of proof is sometimes lacking where its existence is a theoretical certainty. Yet it seemed better to leave such questions open to be settled by a later increase of material.

The work of the A. O. U. Committee on the nomenclature and status of North American birds yielded as satisfactory results as could have been anticipated, nearly nine-tenths of its decisions being reached by practically unanimous consent. The outcome of its deliberations, as embodied in the A. O. U. Code and Check-List, has well stood the test of time, there having been found thus far very few cases where subsequent discoveries have necessitated any revision of the Committee's decisions. A few forms then considered as ineligible to subspecific rank, and therefore rejected, have since been admitted, in consequence of the acquisition of material from new localities rendering their proper status more evident; while others have been described and added to the list. Some of these later discoveries have proved, indeed, little less than startling. These facts, and the very great increase of material during the last five years, have had possibly a too stimulating effect; they have unquestionably started the pendulum again in the direction of finer discriminations and excessive splitting. The majority of the old A. O. U. Committee, the authors of the Check-List, will doubtless now admit forms to subspecific rank they would not have admitted in 1884, had they been then placed before them. They certainly know much more about North American birds at present than they did five years ago, but is their judgment as sound and are their tendencies as rationally conservative?

If any be without sin, let him cast the first stone. Conscious of my own changed tendencies, it has seemed to me well to raise the above question for brief consideration, since it can do no harm to survey the field calmly and take note of the present drift in respect to a very important subject.

Recent investigations have taken me over fields I worked, with some care, ten to fifteen years ago. In the meantime material has greatly increased; series of specimens have been obtained from localities then unknown; thus I find myself looking at

things in a new light, but from, I trust, a more advanced position. My former tendencies, in common with those of others at that time were in the direction of reducing doubtful forms to synonyms, and closely related species to geographical forms. Now, with much additional experience, some increase of knowledge in respect to particular points at issue, and much more abundant material, some of my former conclusions seem open to revision, as I now realize that the resources then at command were far less adequate for the settlement of questions at issue than I then supposed them to be.

The discoveries made during the last five years show that the subject of North American ornithology is far from exhausted, even in respect to the cataloguing of its numerous forms of bird life, and especially as regards their distribution. To show how much we did not know five years ago of the birds of even our long-settled southeastern States, I have but to instance five or six species—namely, Swainson's Warbler, Bachman's Warbler, Leconte's Sparrow, the Raven, and the Seaside Finches. Add to this the new forms recently brought to light in this supposed well-known area, and we must conclude that we are still only on the threshold of a thorough knowledge of the birds of our South Atlantic and Gulf States. What do we as yet know of the distribution of many of the southern subspecies of this area, and of their lines of inosculation with the northern forms? Nothing, with exactness. What do we yet know of the breeding ranges of the summer birds south of the Ohio Valley? Practically nothing. To how slight an extent are we able to unravel the many perplexing problems of the bird fauna of the great State of Texas, so peculiarly situated in relation to the East and the West, the North and the South, as regards North America at large. The great Southwest and the great Northwest, with their opposite extremes of climatic conditions and peculiarities of environment, as compared with the region to the eastward, still present to us many perplexing problems.

Under such a condition it is no wonder that the pendulum again tends in the direction of refined subdivision. We are alert for differences, with our wits sharpened to recognize slight variations in size, in form, and in tones of color. Our material is constantly becoming more ample, and the meaning of slight variations is thus more apparent than it otherwise would be. When large

series of specimens of any species from distant points are compared, in cases where the environment is more or less diverse, we are accustomed to find appreciable differences—in some cases slight, in others so well-marked as to be obvious at a glance. In many instances, however, the differences are apparent only when large series are available for comparison; the differences being merely average differences; a greater or less proportion of the specimens of the two series are practically indistinguishable, the range of individual variation in either series overlapping the difference characterizing the two slightly differentiated forms. In other cases the occurrence of specimens that cannot be easily referred, without knowing their origin, to one or to the other, is exceptional.

These being the general facts in the case we are at once confronted with a serious question and a grave danger. The splitters of an earlier time regarded every form, however slightly differentiated, as a species. We arbitrarily define a species as a group of individuals standing out distinct and disconnected from any similar group, within which, though occupying different parts of a common habitat, we recognize other forms characteristic of, and restricted to particular areas. These reach a maximum degree of differentiation at some point in the habitat, and thence gradually shade into other conspecific forms geographically contiguous.

The distinction we thus make between species and subspecies, though a purely conventional one, forms an indispensable basis for the convenient recognition of the various minor stages in the evolution of organized beings. The serious question is where to draw the line in recognizing local forms in nomenclature. While it is important to discover, and in some way record, even the very slight differences due to peculiarities of environment, there is obviously a reasonable limit to the naming of such forms by the use of the trinominal system of nomenclature. How well-marked then, must be a set of intergrades to entitle them to recognition? On this point no arbitrary hard-and-fast line can be laid down. Much, at least for the present, must be left to the discretion of the investigator. We are still groping in the dark; our steps are, in the main, tentative and provisional. We cannot act decisively in respect to the bird life of North America, or of any large area, till we know thoroughly the phases of variation throughout every nook and corner of the area in question. At present new forms

are coming to light, often where least expected; every considerable series of specimens from any locality previously known only superficially presents us with, if not new nameable forms, at least a new set of puzzling intergrades, tending to unsettle opinions we thought were safely grounded, and showing that every question touching the status of species and subspecies is still more or less open to revision.

Unquestionably the tendency at present is to name forms which six years ago would have been considered too slightly differentiated to require such recognition. On the other hand, differences long since noticed, have but recently come to be properly understood. In the light of new material they prove to have a significance previously unappreciated, owing to the absence of the requisite data.

It is still evident, however, that great caution should be exercised in bestowing trinomials, in order to guard against drawing too fine distinctions. Very little is gained by naming races distinguishable only by experts, aided by a large amount of material, or where the differentiation is largely a matter of a slight average difference between forms contiguous in habitat—forms which nine out of ten ornithologists of average acuteness and experience, and with only ordinary resources, will be more or less unable to satisfactorily distinguish. In fact, a form based on a certain series of specimens may seem to any investigator of this same material well founded, but when judged by other material not unfrequently loses much of the distinctness it seemed to present when tested by the first set of specimens.

There are necessarily, in cases of wide-ranging species which run into well-marked geographical forms, numerous connectent series, made up of intergrades of all degrees of relationship to the more extreme phases. Some of these intergrades may seem different enough from either extreme to warrant recognition as an additional subspecies. By such a course what do we gain? We bridge the difficulty by doubling it; we get rid of one set of of troublesome intergrades by creating two others; leading the way to further subdivision of like character, and increasing the difficulties. Obviously the situation is not in this way improved. Yet the tendency to this sort of division is evidently increasing, each step in this direction making the next one easier. Only the exercise of due discretion can prevent the reduction of "our bene-

ficient system of trinomials" to an absurdity. It is much easier to name a dozen new species or subspecies than to get rid of one, though erected on a false basis. Let us then weave our ornithological net so open-meshed that the undesirable small fry of incipient local forms may readily pass through and escape till further differentiation, in future ages, shall render them desirable captures.*

ON THE EASTERN FORMS OF *GEOTHTYPIS TRICHAS*.

BY FRANK M. CHAPMAN.

THREE years ago I obtained in Florida several Maryland Yellowthroats which apparently differed from northern specimens of this bird. During succeeding winters additional examples were secured, but being unable to obtain summer specimens, which without fear of error could be considered resident birds, I was unwilling to call attention to what I supposed was an undescribed form of this species resident in Florida. Thus the matter rested until recently, when Mr. W. E. D. Scott very courteously placed at my disposal his entire series of Florida specimens. In attempting now with the aid of this additional material to determine the status of the Florida bird, I found it would also be necessary to ascertain the relationships of the Mississippi Valley bird, to which the Audubonian name *roscoe* has recently been applied. To this end, therefore, through the kind offices of fellow naturalists, I have accumulated a large amount of material, in all somewhat over three hundred specimens.

The relationships of the Mississippi Valley bird.—From this region I have a series of some sixty specimens, of which thirty-eight are adult males in breeding plumage; with these I shall make my comparisons. Occupying an intermediate geographical position between the true *patriæ* of both the eastern and the

* In this connection I would call attention to the sagacious note of warning sounded by Dr. Coues in 1884, in the Preface to his 'Key to North American Birds' (p. xxvii, second paragraph).